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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,757	10/19/2006	David F. Moore	015280-484100US	3672
45115 7590 03/27/2009 TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER 8TH FLOOR SAN FRANCISCO, CA 94111				
EXAMINER NGUYEN, HIEN NGOC				
ART UNIT		PAPER NUMBER		
3768				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/550,757

Applicant(s)

MOORE ET AL.

Examiner

HIEN NGUYEN

Art Unit

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SF-08)
Paper No(s)/Mail Date 08/27/2007
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: claim subject in claims 8 and 11 "observing and plotting phase alteration of voxel isochromats at the selected frequency to obtain phase patterns immediately after passing of the alternating current through the coil has ceased but before vibrational energy within the head of the patient dissipates" and "observing the periodicity of the patient's heartbeat for determining a sampling interval with respect to the patient's heartbeat".

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 1-2, 6-8 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-2 and 6-8, what is the applicant definition of plotting? Plotting is not clear to the examiner since the specification does not provide a definition for the term. Examiner interprets plotting as taking images at different phases and observes the differences.

Regarding claim 11, examiner does not understand "observing the periodicity of the patient's heart beat for determining a sampling interval with respect to the patient's heart beat" and "vibrating the head of the patient immediately before a sampling interval at a selected frequency between 125 hertz and 500 hertz". What sampling interval? Is it the sampling interval of the heart beat? Examiner interprets vibrating the head of the patient synchronize with the heart beat.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Felmler et al. (US 6,037,774).
- a mounting for preloading a probe on to the cranium of the patient in a magnetic resonance device; (see col. 7, lines 1-52 and Fig. 1).
 - a coil affixed to the probe for passing vibrations from the coil to the probe; (see col. 7, lines 1-52 and Fig. 1).
 - using the apparatus for passing an alternating current through the coil in the range of 125 hertz to 500 hertz to cause the coil to vibrate within the

magnetic field of the magnetic resonance device and pass the vibrations of the coil to the probe; (see col. 7, lines 52-64 and claims 2-3).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3-5, 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Felmlee et al. (US 6,037,774) and in view of Sinkus et al. (US 6,486,669).

Regarding claims 1, 4-5 and 7-10 Felmlee discloses a method steps for MRE of the brain:

- examining the head of a patient in vivo in a magnetic resonance device; (see col. 3, lines 1-33).
- vibrating the head of the patient during the examination at a selected frequency in the range of 100 hertz; (see col. 7, lines 1-64).
- observing and plotting phase alteration at the selected frequency to obtain phase patterns; (see col. 1, line 16-col. 2, line 59). Examiner interprets plotting phase alteration as taking images at different phases and observes the differences.
- measuring the phase patterns across at least the section of the brain; (see col. 3, lines 55-65 and col.6, lines 35-67).

- affixing a coil to the head of the patient in a magnetic resonance device having a magnetic field; (see col. 7, lines 1-64).
- passing alternating current through the coil to cause vibrational energy to pass from the coil to the head of the patient at a selected frequency in the range of 100 hertz; (see col. 7, lines 1-64).
- affixing a coil to the head of the patient by placing a shaft through the coil to receive vibrations from the coil; (see col.7, line 1-col.8, line 10 and Fig. 1 and 5-7).
- placing a probe in rigid contact with a shaft at one portion and preloading the probe into contact with a human skull at another portion; (see col. 7, lines 35-53 and Fig. 1).
- vibrating the coil to impart vibrations through the shaft to the probe to vibrate in vivo a human brain within the skull; (see col. 7, lines 52-64 and Fig. 1).

However, Felmlee does not explicitly disclose voxel isochromats. Sinkus discloses voxel isochromats use for 3D volume imaging for clearer and easier examination (col.2, lines 4-19, col. 6, lines 8-21 and col. 9, lines 55-67).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Felmlee's method to work in 3d images to obtain phase alteration of voxel isochromats as taught by Sinkus because 3d volume images of phase alteration of voxel isochromats is clearer and easier for examination of the brain than 2d images of phase alteration of pixel isochromats.

Regarding claim 3, Sinkus discloses:

- analyzing the phase patterns utilizing Fourier transform; (see col.6, lines 35-67 and col.10, lines 1-23). Fourier transform perform the same function as Hilbert transforms. They both perform signal transformation and analyzing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Felmlee's method to analyze the phase patterns utilizing Fourier transform as taught by Sinkus because with phase alteration cause by head vibrating Felmlee need to perform signal transformation to obtain phase pattern.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Fourier or Laplace or Hilbert transform to analyze the phase patterns. One skill in the art that understand and know how to use Fourier transform also know how to use Hilbert transform. Hilbert transform and Fourier transform are from the same field of endeavor which is signal processing. Reference US 2002/0156398 by Mansy et al. discloses Hilbert transformation and other transformation such as Fourier and Laplace are use to analyze and transform signal [0036].

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Felmlee et al. (US 6,037,774), in view of Sinkus et al (US 6,486,669) and Bardy (US 6,203,495).

Regarding claim 2, Felmlee and Sinkus disclose substantially all claim limitations set forth in claim 1. However, Felmlee and Sinkus do not disclose taking data from a group of individuals and comparing the measuring of the phase patterns from one individual to other individuals. Bardy discloses taking data from group of individuals and comparing the measuring data from one individual to other individuals to determine individual with medical problem (col. 12, lines 19-35).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Felmlee's method repeating the examining, vibrating, observing, plotting and measuring steps for a group of individuals and comparing the measuring of the phase patterns from one individual to other individuals as taught by Bardy because without taking data from a groups of individual and comparing the measuring of the phase patterns from one individual to other individuals one can not tell which individual has brain tumor. Compare result of one individual to another to determine abnormal tissue in the brain.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Felmlee et al. (US 6,037,774), in view of Sinkus et al. (US 6,486,669) and in view of Muthupillai et al. (Magnetic Resonance Imaging of Transverse Acoustic Strain Waves (provided in the applicant submitted IDS)).

Felmlee and Sinkus disclose substantially all claim limitations set forth in claim 1. However, they do not disclose observing and plotting phase alteration of

voxel isochromats occurs after vibrating the head of the patient for about a time period of 5-200msec. Muthupillai discloses observing and plotting phase alteration of voxel isochromats occurs after vibrating the head of the patient for about a time period of 50-300msec (pages 268, col. 2, lines 16-39).

Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Felmlee's method to observe and plot phase alteration of voxel isochromats occurs after vibrating the head of the patient for about a suitable time period as taught by Muthupillai because Felmlee need to vibrate the head long enough to see the mechanical excitation effect. Felmlee only need to observe and plot phase alteration of voxel isochromats occurs after vibrating the head of the patient because the effect on the brain cause by mechanical excitation (vibration) does not happen before the vibration.

9. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Felmlee et al. (US 6,037,774), in view of Sinkus et al. (US 6,486,669) and Kandori et al. (US 2002/0062076).

Regarding claim 11 and 12, Felmlee discloses:

- examining the head of a patient in vivo in a magnetic resonance device; (see col. 3, lines 1-33).
- observing and plotting phase alteration at the selected frequency to obtain phase patterns; (see col. 1, line 16-col. 2, line 59). Examiner interprets plotting phase alteration as taking images at different phase.
- measuring the phase patterns across at least the section of the brain; (see col. 3, lines 55-65 and col.6, lines 35-67).

However, Felmlee and Sinkus do not disclose observing the periodicity of the patient's heartbeat.

Kandori discloses:

- observing the periodicity of the patient's heartbeat to determine bio-magnetic field; see Kandori [0109-0110].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Felmlee's method to observe the periodicity of the patient's heart beat as taught by Kandori because by observing the patient heart beat Felmlee can determine when to vibrate the head according to the patient heart beat and vibrate the head at selected frequency between 125 hertz and 500 hertz immediately before sampling the patient heart beat to synchronize with the bio-magnetic field generate by the body.

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Felmlee et al. (US 6,037,774), in view of Austerman, III et al. (US 6,650,622) and of van de Plassche et al. (US 4,185,236).

Felmlee disclose substantially all claim limitations set forth in claim 13. However, he does not disclose using high pass filter and a current stabilized amplifier. Austerman, III discloses a high pass filter to block DC current flow (col. 7, lines 1-43). Van de Plassche discloses a current stabilized amplifier to stabilize current flow (abstract and col. 1, lines 5-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Felmlee's device to have a high pass filter and a current stabilized amplifier as taught by Austerman and van de Plassche because with a high pass filter Felmlee can prevent flow of DC current and the best measure for vibration of brain occur when the current flow is stabilized.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,592,085; US 5,185,576; and US 6,656,122.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIEN NGUYEN whose telephone number is (571)270-7031. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. N./
Examiner, Art Unit 4158

